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Malaria in Greece.

An Address delivered to the Oxford Medical Society on the 29th November, 1906.

BY

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Professor of Tropical Medicine, University of Liverpool.

LET me begin by describing exactly my own experiences in Greece. As everyone knows, the country consists principally of a mass of mountains with small valleys between them here and there, and many straits and inlets of the sea. In fact, the configuration is very like that of the Highlands of Scotland. The scenery does not possess the great variety of colour caused by the light and shade of the humid atmosphere of the Highlands; it is brightly but uniformly coloured. On the other hand, its comparative aridity is compensated for by a singular beauty and variety of contour, which are not excelled in the Alps, or even in the Himalayas. High enough to retain for most of the months of the year an exquisite lacing of snow, the mountains, though barren and stony, make a long vista of outlines against the very lovely sky. I have never seen a sky equal to that of Greece. In the tropics a yellow light is reflected from the burning ground upon the lower strata of the air, and only the zenith is blue; but in Greece the azure extends almost down to the horizon, except for a narrow margin of brilliant silvery or pearly light. After sunset the sky seemed to me to possess, not the deep night blue of the tropics, but a wonderful purple tint of its own, in which the "new-bathed

stars" shine with a brilliance not exceeded evcn in the desert. At mid-day the almost tropical glare of the sun on the chalky soil is relieved by the dark shades of the plane trees and the classical cypresses, and the bright green of the vines. It has been my fortune to see many beautiful countries, but I think that Greece and Britain hold the palm.

The particular valley which I was called upon to visit was that of Lake Kopais, in Boeotia. After leaving Athens, the comfortable train winds along between Mount Pentelikon on the south and Mount Parnes on the north, Then, passing across the eastern spurs of Parnes, in full sight of the island of Euboia and its strait on the right, it enters the valley of Thebes. Traversing this, it goes through the defile of the Sphingion (where the Sphinx used to waylay travellers with her riddles) and emerges on the Kopaik Plain. This is a large area about six miles broad and twelve miles long, the long axis pointing west and east. On the east the plain is bounded by the mountain of the Sphinx, which seems. from certain points of view, to have the shape of a woman's figure reclined along its crest. Along the whole of the south side runs the beautiful range of Helikon, the mountain of the Muses. The birth place of Hesiod is in one of its valleys; and near one of the summits there is the famous fountain of Hippokrene, where the winged horse, Pegasus, took flight to heaven, owing, it is said, to some annoyance from the literary critics of the day. At the western extremity of the plain rises the magnificient mass of Mount Parnassos, the mountain of Apollo, with its summits clad in dazzling snow. The Kopaik Plain itself is almost absolutely flat right up to the feet of the hills which bound it, being, indeed, the dried bed of a lake. In ancient days, according to the interesting writings of Dr. J. G. Frazer of Cambridge, this lake was a large sheet of water in the winter, and in the summer a series of marshes overgrown with sedge, with rivers winding

through them and patches of dry land between. The lake was drained in very remote times by the people of Orchomenos, a town upon its banks, and the remains of drainage works are still visible. The water enters from a number of small rivers and streams gushing out of the surrounding mountains, and naturally escapes, singularly enough, into great caverns, of which there are many, called katavothra. In the middle ages, the drainage works appear to have been allowed to fall out of repair; but recently a French company resumed the task; and, still more recently, the work was taken up by the British company, the Lake Kopais Company, which asked me to study the malaria for them. The whole bed of the ancient lake is now a great plain covered with crops of all kinds, which repay the cost of the engineering works. The water is at present discharged through adjacent valleys into the sea.

It was here that the malaria was so troublesome. The Lake Kopais Company has many hundreds of employees and tenants, who were constantly attacked, although most of them were natives of Greece. It had not been found possible to keep accurate statistics of the annual number of cases; so that my first care was to make an estimate for myself of the amount of malaria present. This can be done with a fair degree of accuracy, without the help of statistics, in two ways—by ascertaining the proportion of people which, first, have the parasities of malaria in their blood, and, secondly, possess enlarged spleens. The first method was much used in India by Stephens and Christophers, who called the ratio of infected persons to the total population, the *endemic index*. To obtain an an absolutely correct figure by this means we must make an exhaustive microscopical examination of the blood of every person in the area under consideration; but this would be too laborious for practical purposes, and we must consequently content ourselves with an approximate valuation obtained by examining only a part of the local

population. As shown by these observers, and by Professor Koch, it is especially the native children in a malarious locality who have the parasites in detectable numbers—the older people becoming comparatively immune. The blood of a number of unselected children is therefore carefully searched for the parasites, and the ratio so obtained is recorded as the approximate endemic index. For exact work, a large number of children must be examined, as otherwise the margin of error, as shown by Poisson's formula, will be very considerable. For example, if fifty children be examined, and twenty-five of them be found to contain parasites, the error will be no less than twenty per cent.; so that the approximate endemic index will not be fifty per cent., as a hasty observer may think, but anything between thirty per cent. and seventy per cent. This fact is worth recalling, because it has been much overlooked in recent work on the subject, and because it shows how laborious the method is. The second method, that of examining children for enlargement of the spleen, a thing which can be done in a minute, is much easier, and fairly trustworthy, provided that no other cause for splenomegaly is present.

With the valuable assistance of Dr. Kardamatis, General Secretary of the Grecian Antimalaria Society, and of Mr. D. Steele, Manager of the Lake Kopais Co., in Greece, I was able to use both methods. The company's houses are on the southern border of the plain, close to the site of the ancient Haliartos, where the Spartan Lysander was defeated by the Thebans, B.C. 395, and to the reputed grave of Alkmene, the mother of Hercules. The houses are built just where the slopes of Helikon begin to rise from the plain; so that they were obviously not too highly situated to be affected by the malaria. On examining fifty-seven of the employees, most of whom were Greeks, we found enlargement of the spleen in fourteen and parasites in nine. But five of those that had parasites had no enlargement of the

spleen, and must be added to the infected list, which, therefore, amounts to nineteen out of the fifty-seven, or one-third. The majority of these people were adults; and many had come from other localities, so that the figures are not useful for statistics.

Our next care was to examine the people in some of the neighbouring villages. Out on the plain, about a mile or more from the company's houses, there is the village of Moulki, containing some three hundred and fifty inhabitants. The houses are closely clustered together with very irregular and elementary lanes between them. Going to the village inn, close to the school, we set to work and examined eighty persons, mostly children; first, by palpating them for enlargement of the spleen and, secondly, by making dried films of their blood for future microscopical enquiry. The scene was most interesting. Seated under a large tree, with the village priest as our patron and protector, we pricked and palpated the little ones, one by one. I never saw pluckier children. Scarcely one of them even winced at the vivisection. Nearly all of them were very intelligent, and many good looking; but, alas, most of them were far from well and some looked miserably ill, emaciated, and anæmic. The cause was speedily revealed. Out of sixty-two of the children, between the ages of five months and fourteen years, no less than thirty-five were found to have enlarged spleens; and as no other cause of endemic splenomegaly, such as kala-azar, could be ascertained to be present in the locality, we could attribute the enlargement in these children only to malaria. This diagnosis has been fully confirmed by subsequent examinations of the blood films, which showed that the parasites existed in at least seventeen of the sixty-two children at the time when the films were made. Of these five had no appreciable enlargement of the spleen, so that this number must be added to the number of spleen cases in order to arrive at the total yielding

evidence of infection. Hence out of the sixty-two children no less than forty were certainly infected—a ratio for them of 64·5 per cent. This is, of course, the lower limit of the ratio, because it is quite possible, and indeed very likely, that the parasites were overlooked in some of the films. Such a ratio was unexpectedly high for any European country and is almost equal to any that has been found in Indian or African children.

Of course many of the children were shockingly anæmic and emaciated—not in any way, I was informed, from lack of food, nor, apparently, from the great prevalence of other diseases. The work was clearly that of the spirit of the marsh.

The next thing to do was to find the source of the malaria, or rather its carrying agents the local Anophelines. As I have said the Kopaik Plain is now drained and cultivated over its whole extent; but numerous small streams enter it from the surrounding hills, traverse it, and discharge into the main channels of drainage. These streams are swollen torrents in the winter, but in the summer often became trickles of water with occasional marshy borders here and there. Several such streams enter the basin near Moulki; but at that season (May—June) we could find no Anopheline larvæ in them, though some have been found subsequently, as we conjectured would happen with the advance of the dry season. But in addition to these streamlets there exists a long series of shallow pools suitable for the larvæ in the "borrow-pits" made by the engineers who constructed the railway embankment across the plain. Sure enough in some of these pits close to Moulki we found the peccant insects—the larvæ of *Anopheles maculipennis*, a known carrier of malaria. The gnats, rising from the pools, pour into the village and into neighbouring houses, such as those of the company; become infected by biting the numerous infected children, and then infect any healthy person whom they may subsequently bite. The

old drama, now so well known, was obviously being played out again before our eyes.

After having dealt with Moulki we examined the conditions at another villiage of about 575 inhabitants, situated several hundred feet high on the hills south of the company's houses and called Mazi. Out of forty school children, we found enlargement of the spleen in thirteen, and the parasites of malaria in sixteen. Of those that showed the parasite, seven had no enlarged spleen, so that we must add them to our total of infected children—giving twenty infected out of a total of forty examined, that is, one half. This is a large proportion, and we expected to find some breeding-pools of Anophelines close at hand. In this however we failed; though we saw some lime pits which we thought might become suitable for the larvæ at a later season. But, nevertheless, there was no difficulty in explaining the malaria at Mazi, since we learnt that every year nearly the whole population descends to the Plain for the harvesting in the month of August (the most malarious month) and bivouacs there for days or weeks. Doubtless the people of Mazi become infected on these occasions, though I suspect that breeding pools will be found close to the village by more extensive search.

My time being very limited, we could make only hasty studies at other spots. Across the Plain lies the village of Skripou, on the site of the ancient Orchomenos. Here we found splenic enlargement in exactly half of forty school children examined, but had no time to take blood films. The village is evidently intensely malarious. We had time to look for mosquito larvæ only in one spot, the beautiful Fountain of the Graces, which gushes out of the mountain and spreads in a small marsh near at hand. Here again we found the shameless insects desecrating the divine spot. What must have happened when the Graces bathed there I cannot say. We only saw washerwomen and geese.

Thus, on the borders of the Kopaik Plain, we had examined 142 children, and had found certain evidence of malaria in no less than eighty or fifty-seven per cent.—a very high malaria rate. But we soon obtained evidence that the disease is not confined to this low-lying area. Livadhia is a beautiful little town of 6,250 inhabitants, situated 540 feet up the spurs of Helikon, some miles beyond the western end of the plain and facing Mount Parnassus. It begins in the romantic gorge where was the oracle of Trophonios in former days, and where the two springs of Lethe and Mnemosyne—Forgetfulness and Memory—now flow out of the rock. Notwithstanding the height of the situation and the absence of any apparent marshes close at hand, we found enlargement of spleen in sixteen out of 100 school children here. The infection is probably obtained in lower areas outside the town; but we had no time to make any search for the Anophelines. We spent some hours, also, at Thebes itself. This famous place, which used to contain 40,000 inhabitants, now contains only 4,780. Situated on a rocky eminence in the midst of a large plain, the historic Kadmeia, it is considered to be very fairly healthy; and, indeed, we found enlargement of the spleen in only one child out of fifty examined; and failed in obtaining any larvæ of Anophelines in several small pools round the base of the renowned citadel. Such researches carried out on the spot where lived Pindar and Epaminondas, where Theban, Athenian and Spartan had frequently mingled in battle, and where angry Alexander wreaked his vengeance, were "of the age." I am not certain whether the little wriggler of the puddles has not been a worse enemy to Thebes than was the great conqueror. One remains; the other has passed away for ages. If Diogenes had possessed our present knowledge he might have made a still more caustic reply to his powerful visitor.

Thus, altogether, out of 292 unselected children

examined by us in five different places we found unmistakable evidence of malaria in ninety-seven, or one-third. In addition to the children, we examined eighteen adults at Moulki. As is now well known the adult natives of a malarious locality become comparatively immune, their spleen returning to the normal size and the parasites becoming extremely scarce in their blood. Nevertheless we found signs of malaria in four of these adults—but, of course, such figures are not useful for estimating the endemic index. Including all we found certain evidence of malaria in 120 out of 367 persons, or thirty-two per cent. The figures for the children, however, give a reliable and high malaria rate, especially when it is remembered that they were collected at the beginning of the summer, *before the annual malaria season had commenced.* Later in the year the endemic index would certainly have been still higher. If, moreover, we had examined the blood of the 200 children dealt with at Orchomenos, Livadhia, and Thebes, we should certainly have been able to add many other cases of infection to our list; while lastly, it should be remembered that in all cases of malaria the parasites frequently become temporarily too few for detection by the microscope. Our total estimate of 33·2 per cent. infected children must, therefore, be much below the maximum ratio, and may be looked upon as a minimum ratio. The statistical correction by Poisson's formula works out at 7·7 per cent.; so that we have finally for the five localities, Moulki, Mazi, Orchomenos, Livadhia, and Thebes, a minimum child-malaria rate of between 25·5 per cent. and 40·9 per cent. The truth is, probably, that at Moulki and Orchomenos *all* the children are really infected in the autumn.

With regard to the number of breeding places of Anophelines we found them only in two small pools, one at Moulki and one at Orchomenos, and the former of these was immediately drained away by Mr. Steele, of the Lake Kopais Company. The season however was early,

and our search far from exhaustive. Many more pools will of course be found, but nevertheless I infer that the amount of breeding surface per square mile of country is extremely small, so that antipropagation measures ought to be correspondingly cheap.

Such were the results of my own observations, and I will now give briefly some figures which I obtained for the whole of Greece. Within the last year or two there has been founded at Athens, an admirable Malaria Society for the study of such questions. It is under the patronage of H.M. the King of Greece, and consists of many enthusiastic members. One of these is my friend Dr. Savas, Professor of Hygiene at the University of Athens, and Physician to the King of Greece; and the General Secretary is my friend Dr. Kardamatis, who gave me so much assistance at Lake Kopais. I can testify to the complete knowledge of the subject possessed by both of these gentlemen—whom I mention more particularly than their colleagues because I was brought more especially into contact with them—to their zeal in the cause, and to their philosophic grasp of the importance of the malaria question for their country. From them I obtained the following approximate figures for the whole of Greece :—

Population of Greece - - -	2,433,806
Average annual number of cases of malaria -	250,000
Average annual number of deaths from malaria	1,760
Number of cases of malaria during 1905 -	960,048
Number of deaths from malaria during 1905 -	5,916

These figures are, I think, as sound as any that can be collected from statistics. Malaria is a very difficult disease to deal with in this way, because it does not consist of a single severe attack demanding immediate attention, but rather of a series of comparative slight attacks extending over a period of years, and, moreover,

occuring principally in young children. Many cases do not find their way into the returns at all; while, on the other hand, relapses must be frequently entered as fresh infections. As for the death rate, comparatively few cases die simply of malaria, but many are carried off by intercurrent pneumonia or diarrhœa, or perish gradually from anæmia, under which headings the mortality is often recorded. The figures given above, however, agree entirely with my own estimate of the endemic index round Lake Kopais, and I believe that if similar methods could be used all over Greece—if all the children in the country could be examined—it would be found that an extremely large proportion of them are constantly infected. Last year was a very bad year, with a recorded death rate of 24 per thousand of the population. Nor is the malaria of a benign type in Greece. On the contrary, I was informed by all the gentlemen mentioned above, and also by a number of medical men whom I met at Thebes and Livadhia, that pernicious attacks are very common, and that the most serious form, that of blackwater fever, is extremely common. Such facts are recorded also in the writings of Kardamatis, Savas, and other able Greek observers. The disease is therefore extremely, if not shockingly, rife in the country—much more so even than in Italy. Dr. Savas told me that, from some statistics which he had studied, the number of cases and deaths in Greece are half again as numerous as in Italy for equal numbers of people. All species of the parasites are to be found in Greece. In our own studies, the mild tertian parasite occured most frequently, the so-called malignant species next commonly, and the quartan least of all—but not rarely. As I have said, blackwater fever, the worst form of malaria, has been very common in Greece. Regarding the species of Anophelines which carry malaria in the country, Dr. Savas told me that out of 1,839 of these insects, 1,778 were found to be *Anopheles maculipennis*, twenty-one to be *Anopheles bifurcatus*, and twenty

to be *Pyretophorus superpictus*, all well-known agents of the disease.

Now what must be the effect of this ubiquitous and everlasting incubus of disease on the people of modern Greece? Remember that the malady is essentially one of infancy among the native population. Infecting the child one or two years after birth, it persecutes him until puberty with a long succession of febrile attacks accompanied by much splenomegaly and anæmia. Imagine the effect it would produce upon our own children here in Britain. It is true that our children suffer from many complaints—scarlatina, measles, whooping cough—but these are of brief duration and transient. But now add to these, in imagination, a malady which lasts for years and may sometimes attack every child in a village. What would be the effect upon our population, especially our rural population—upon their numbers and upon the health and vigour of the survivors? It must be enormous in Greece. People often seem to think that such a plague strengthens a race by killing off the weaker individuals; but this view rests upon the unproven assumption that it is really the weaker children which cannot survive. On the contrary, experience seems to show that it is the stronger blood which suffers most—the fair, northern blood, which nature attempts so constantly to pour into the southern lands. If this be true, the effect of malaria will be constantly to resist the invigorating influx which nature has provided; and there are many facts in the history of India, Italy, and Africa, which could be brought forward in support of this hypothesis.

We now come face to face with that profoundly interesting subject, the political, economical, and historical significance of this great disease. We know that malaria must have existed in the time of Hippocrates, about 400 B.C. What effect has it had on the life of the country? In the prehistoric times Greece was certainly peopled by successive waves of Aryan invaders from the north—

probably a fair haired people—who made it what it became, who conquered Persia and Egypt, and who created the sciences, arts, and philosophies, which are only developing further to-day. That race reached its climax of development at the time of Pericles. Those great and beautiful valleys were thickly peopled by a civilisation which in some ways has not since been excelled. Everywhere there were cities, temples, oracles, arts, philosophies, and a population vigorous and well trained in arms. Lake Kopais, now almost deserted, was surrounded by towns whose massive works remain to this day. Suddenly, however, a blight fell over all. Was it due to internecine conflict or to foreign conquest? Scarcely, for history shows that war burns and ravages but does not annihilate. Thebes was thrice destroyed, but thrice rebuilt. Or was it due to some cause, entering furtively, and gradually sapping away the energies of the race by attacking the rural population—by slaying the new born infant, by seizing the rising generation, and especially by killing out the fair haired descendant of the original settlers, leaving behind chiefly the more immunised and darker children of their captives, won by the sword from Asia and Africa? Those who have read Dr. W. North's facinating book on Roman Fever (Sampson Low, Marston & Co., 1896) will remember the suggestion that the depopulation of the Campagna was due to the sudden introduction of malaria by the mercenaries of Sylla and Marius, and so recently as 1866, as we know from the works of Dr. Davidson, of Edinburgh, malaria entered and devasted the islands of Mauritius and Réunion, either the mosquito or the parasite having been then brought in from without. Similarly, could it not have been introduced into Greece about the time of Hippocrates, by the numerous Asiatic and African slaves taken by the conquerers? Supposing, as is probable, that the Anophelines were already present, all that was required to light

the conflagration was the entry of infected persons. Once started the disease would spread by internal intercourse from valley to valley, would smoulder here and blaze there, and would, I think, gradually eat out the high strain of the northern blood. I cannot imagine Lake Kopais, in its present highly malarious condition, to have been thickly peopled by a vigorous race; nor on looking at those wonderful figured tombstones at Athens can I imagine that the healthy and powerful people represented upon them could have ever passed through the anæmic and splenomegalous infancy (to coin a word) caused by wide spread malaria. I venture only to suggest the hypothesis, and must leave it to scholars for confirmation or rejection. Of one thing I am confident, that causes such as malaria, dysentery, and intestinal entozoa must have modified history to a much greater extent than we conceive. Our historians and economists do not seem even to have considered the matter. It is true that they speak of epidemic diseases, but the endemic diseases are really those of the greatest importance.

The same cause works the same evil in modern Greece. Though the country has been freed from the Turks for seventy years, and enjoys what is considered to be (though personally I doubt it) the best form of government, yet its population has not increased very much. Athens has about 130,000 inhabitants, and Patras, the next largest city, about 40,000, and the other towns are scarcely more than large villages. The rural areas contain small and poor, but not destitute, hamlets; but what strikes one most in them is the absence of villas, and of large hotels. Few of the wealthier people seem to live in the country. A gentleman of Athens told me that he bought a shooting box, but that he was attacked by malaria when he went to stay there. The inns are comparatively small and shabby, and not likely to be frequented by many modern tourists, and the methods of communication are primitive. This is very surprising,

because one would think that such a country would be the Mecca of all the tourists of Europe and America, who would pour their millions of pounds into it, just as they do into Switzerland. But of course the reputation of unhealthiness possessed by many of the rural tracts is fatal; the tourist thinks twice about going to them, and the innkeeper hesitates about spending his capital in a locality where he and his children may expect to be frequently ill. The whole life of Greece must suffer from this weight which crushes its rural energies. Where the children suffer so much, how can the country create that fresh blood which keeps a nation young. But for a hamlet here and there, those famous valleys are deserted. I saw from a spur of Helikon the sun setting upon Parnassos—Apollo as he was wont to do towards his own fane at Delphi—and pouring a flood of light over the great Kopaik Plain. But it is seemed he was the only inhabitant of it. There was nothing there. "Who," said a rich Greek to me, "would think of going to live in such a place as that." I doubt much whether it is the Turk who has done all this. I think it is very largely the malaria.

Now regarding the remedy. Science has of course shown absolutely that the disease is carried by gnats, and, in doing so, has indicated several methods of prevention. First, there is the method of excluding gnats by the careful use of mosquito nets and wire gauze screens to the windows—useful for the houses of the rich, but too costly and troublesome for the poor. Then there is the method of Koch, the cinchonisation of all the patients—by which they themselves are benefited, while the gnats do not become infected and therefore do not spread the parasites; but this implies rigorous dosing with quinine for months—a thing which patients and the mothers of children often will not submit to. But the method which I first suggested and elaborated in 1899, namely, the reduction of mosquitoes, is the one which I prefer, and the one

which, after seeing the conditions in Greece, I prefer more than ever. It is, of course, the old Roman plan of drainage against malaria, with this important difference, that we are no longer compelled to drain the whole surface of a malarious area, but only those small pools in which the Anophelines breed. This method has the immense advantage that it can be carried out by local authorities without troubling the people, while in the end it is sure to be more economical and lasting in its effects than other methods, which, I think, are apt to cause waste both of money and effort. To Greece it is most especially applicable. There the rainy season is the winter, when the mosquitoes do not breed, so that in the arid summer they can find only very few suitable breeding pools. So much the easier and cheaper will it be to treat these. They can be rendered uninhabitable for the larvæ by drainage, by filling up, by deepening, by dragging the weeds, and, in the last resort, by periodic oiling. Where carried out with intelligence and loyalty, as in Havana, the Federated Malay States, and Ismailia, the work has proved comparatively easy and cheap, while the results—now so well known—have been of the most brilliant kind. I think that Greece, owing to the scarcity of surface water suitable for the larvæ in the summer, will be easier to deal with than any of these places—easier even than Ismailia, with its irrigation system. It will be strange indeed if so intelligent a nation cannot carry out such simple measures in order to rid itself of a plague that has oppressed it for ages.

The Grecian Malaria Society has commenced the work with energy. It has investigated local conditions; has issued numerous tracts to the people; has urged railway companies to screen stations and government to undertake drainage. Dr. Savas suggests government regulation of the sale of quinine in order to improve and cheapen the drug—a most necessary item. At Athens, where malaria exists only along the bed of the Ilissos, the

stream has been "trained" in many places. Presently I hope that we shall see a survey made of the malaria and the local breeding places in the whole of Greece, preparatory to a general onslaught on the foe. When I was in Athens, I had the pleasure of speaking to M. Theotakis, the Premier, and Mr. Boufidis, the President of the Chamber, and I am sure that the Government will do its best to support the campaign. But the society will have to fight many enemies, chief among which will be the incredulity and indifference of the public. I have, therefore, suggested that in Britain we may help the society by doing something to show our support of it. The Liverpool School of Tropical Medicine has accordingly offered its assistance, which has been accepted by the King of Greece; and we have opened a list of supporters which now include many eminent names, beginning with those of the Greek minister in London, the British minister in Athens, the presidents of the Royal Society and the British Academy, the Royal College of Physicians, and many Greeks residing in Britain. It often happens that a little foreign support will do more to encourage a cause than much local effort can do. If any wish to join us we shall welcome them most heartily. You have but to write a note to me or to our secretary, A. H. Milne, Esq., B10, Exchange Buildings, Liverpool.

When matters are in proper train every year will see the removal of a number of the little marshes which are so injurious to the country—every year will see a decrease in the malaria. I venture to say, with confidence, that, give us but the necessary means—and we do not require much—there is no country in the world from which we could not extirpate the disease. Hitherto we have contented ourselves in diminishing it in isolated towns. Let us now deal with whole nations. Remember that it has actually been banished from Great Britain, almost by unconscious agencies. We have only to imitate those agencies consciously. What a triumph it will be for that

great science of medicine if she can wipe out this miasm, this defilement, from an entire country. I will not hesitate—such is our ambition. And that country is Greece.

I asked a Greek friend why his countrymen did not restore the Parthenon. He replied it was because they were unwilling to touch the sacred ruins without the assent of the whole world, to whom they belonged. So also Greece belongs to the whole world. We all share in her troubles, and should do our best to relieve them. Many years have passed since Byron gave his life for Greece. He attributed her misfortunes to loss of liberty. Perhaps so; but I think that an enemy more inveterate than the Turk has also destroyed her. Not least among the nations, Britain has studied to help her against her human enemies. Should we not help her now against the more potent enemy which we have discovered? That science which, more than two thousand years ago, she created is at our side urging us on. We have no doubt of the result—we need only to nerve the arm to strike.

It was my good fortune to stand the other day at a spot from which can be seen within eyeshot the birthplace of sciences, art, philosophy, the drama—of Europe, of our modern civilisation. It was a great rock rising in the midst of a city built on a plain—not a boundless uninteresting expanse, but a plain, defined as such by a cincture of beautiful mountains. I have known many of the loveliest scenes of this wonderful earth, but nothing altogether equal to the Attic Plain. The rock was the Acropolis, and the setting sun flooded it with light. Upon it rose those ruins which are unsurpassable, unpaintable, and indescribable, because they were built not only for themselves but for the visions which surround them —the Propylaea, the Erechtheion, the Parthenon. And who was the god for whom that temple was built—which of all those gods, who are not as dead as some imagine,

but who live now and will live for ever until, as the poet says, "the future dares forget the past"—who live because they are the everlasting types of our own spirit? That goddess whose birth and victory were recorded on the pediments of the Parthenon; who sprang, not from the common zygosis of nature, but full-armed from the head of Zeus at the touch of Fire and Toil; who conquered the Deep himself. Study her attributes, perceived and recorded in the legend by the sages who lived before history was born, and we shall know her. Without human weakness, she led Ulysses through the dangers of the Deep, she gave Perseus the weapons with which he slew the monster of the Deep, she destroyed the city of the Deep, she made Athens triumph over the Deep, and to-day has lifted man in a few centuries from the Deep to heights unimagined before—Science herself. The Parthenon was the temple of Science. The great figure of Science standing before it dominated the whole of Greece. At its gates, even, stood the figure of Hygieia, the Science of Health, whom we now invoke. Science is the goddess whom we serve, as did the ancient Athenians, because we know that she and she alone can save us from those elements of the Deep which oppress us. We are her servants. We honour not the baser gods—the quack remedies, the sham philanthropies, the false knowledges, the mock philosophies, the whining pities, the lying politics, which keep men down in the depths. We acknowledge only the intellect which sees the truth and smites the evil. Let us pray Pallas Athena to revisit the land where she was born.

RONALD ROSS.